IN THE CLAIMS

Please amend the claims as follows:

1-2. (Cancelled).

3. (Currently Amended) A method for reducing the number of bits of a digital input signal, said method comprising the steps of:

adding a pseudo-random noise signal to the digital input signal to form an intermediate signal, the pseudo-random noise signal being defined by noise parameters; and

quantizing the intermediate signal having a word length of n bits to a reduced word-length signal having a word length of m bits, where n and m are integers, n being larger than or equal to m, the quantizing of the intermediate signal including a first transfer function which is non-linear, the first transfer function being defined by non-linear device parameters, a quantization step of the first transfer function for small amplitudes being smaller than a quantization step for large amplitudes,

wherein the gain of the first transfer function is substantially equal to one for small amplitudes, and wherein the gain decreases for large amplitudes,

and wherein the first transfer function equals:

$$M_e/D_i = c_1 \tanh( c_2 D_i + c_3 ).$$

in which $M_e$ is the reduced word-length signal, $D_i$ is the intermediate signal, and $c_1$, $c_2$, $c_3$ are the non-linear device parameters.

4. (Cancelled).

5. (Previously Presented) The method as claimed in claim 3, wherein the amplitude of the noise signal is at least equal to a predetermined noise value.

6. (Cancelled).

7. (Currently Amended) A method for ~~reducing the number of bits of~~generating and recording on a recording medium encoded signals from a digital input signal, said method comprising the steps of:

adding a pseudo-random noise signal to the digital input signal to form an intermediate signal, the pseudo-random noise signal being defined by noise parameters; and

quantizing the intermediate signal having a word length of n bits to a reduced word-length signal having a word length of m bits, where n and m are integers, n being larger than or equal to m, the quantizing of the intermediate signal including a first transfer function which is non-linear, the first transfer function

being defined by non-linear device parameters, wherein said method further comprises the step of:

recording the reduced word-length signal, the non-linear device parameters and the noise parameters as the encoded signals on a recording medium.

8. (Previously Presented) The method as claimed in claim 7, in which the recording medium is a compact disc and the reduced word-length signal is recorded on a first channel, and the non-linear device parameters and the noise parameters are recorded on a second channel, the first channel and second channel being separate channels.

9. (Currently Amended) A method for ~~reducing the number of bits of~~generating and recording on a recording medium encoded signals from a digital input signal, said method comprising the steps of:

adding a pseudo-random noise signal to the digital input signal to form an intermediate signal, the pseudo-random noise signal being defined by noise parameters; and

quantizing the intermediate signal having a word length of n bits to a reduced word-length signal having a word length of m bits, where n and m are integers, n being larger than or equal to m, the quantizing of the intermediate signal including a first

transfer function which is non-linear, the first transfer function being defined by non-linear device parameters,

wherein said method further comprises the steps of:

forming a difference signal, the difference signal being equal to the intermediate signal minus the reduced word-length signal; and

recording the difference signal, the non-linear device parameters and the noise parameters as the encoded signals on a recording medium.

10-11. (Cancelled).

12. (Currently Amended) A signal processing apparatus comprising:

a pseudo-random noise generator for generating a noise signal defined by noise parameters;

an addition element connected to the pseudo-random noise generator for adding the noise signal to a digital input signal thereby forming an intermediate signal; and

a first quantizing element connected to the addition element for transforming the intermediate signal, having a word length of n bits into a reduced word-length signal having a word length of m bits, n and m being integers and n being larger than or equal to m, wherein,

the quantizing element has a non-linear transfer function, the non-linear transfer function being defined by non-linear device parameters, ~~and~~ wherein

a quantization step of the non-linear transfer function for small amplitudes being smaller than a quantization step for large amplitudes, the gain of the non-linear transfer function being substantially equal to one for small amplitudes, and the gain decreasing for large amplitudes, and wherein

the non-linear transfer function equals:

$$M_e/D_i = c_1 \tanh( c_2 D_i + c_3 ),$$

in which $M_e$ is the reduced word-length signal, $D_i$ is the intermediate signal, and $c_1$, $c_2$, $c_3$ are the non-linear device parameters.

13. (Cancelled).

14. (Cancelled).

15. (Previously Presented) A signal decoding apparatus for recovering an output signal from ~~a reduced word-length signal~~encoded signals recorded on a record carrier, said ~~record carrier also having recorded thereon~~encoded signals including a reduced word-length signal, non-linear device parameters and noise

parameters used to generate the reduced word-length signal from an input signal, said signal decoding apparatus comprises:

means for extracting the reduced word-length signal, the non-linear device parameters and the noise parameters from the record carrier;

a quantization element coupled to said extracting means for processing said reduced word-length signal using a non-linear transfer function to form a decoded signal, said quantization element having a control input for receiving said non-linear device parameters for adjusting said non-linear transfer function to be inverse to a non-linear transfer function used to form said reduced word-length signal;

a noise source for providing a subtraction noise signal, said noise source having a control input for receiving said noise parameters for adjusting the subtraction noise signal to substantially equal to a noise signal used in forming said reduced word-length signal; and

a subtraction element for subtracting the subtraction noise signal from the decoded signal to form the output signal, whereby the output signal corresponds to the input signal.

16. (Currently Amended) A signal processing apparatus comprising:

means for adding a pseudo-random noise signal to a digital input signal to obtain an intermediate signal, the pseudo-random noise signal being defined by noise parameters; and

means for quantizing the intermediate signal, having a word length of n bits, to a reduced word-length signal having a word length of m bits, n and m being integers and n being larger than or equal to m, wherein

the quantizing means includes a first transfer function which is non-linear, the first transfer function being defined by non-linear device parameters, ~~and~~ wherein

a quantization step of the first transfer function for small amplitudes being smaller than a quantization step for large amplitudes, the gain of the first transfer function being substantially equal to one for small amplitudes, and wherein the gain decreases for large amplitudes, and wherein

the first transfer function equals:

$$M_e/D_i = c_1 \tanh( c_2 D_i + c_3 ),$$

in which $M_e$ is the reduced word-length signal, $D_i$ is the intermediate signal, and $c_1$, $c_2$, $c_3$ are the non-linear device parameters.